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THE IMPACTS OF HUMAN ACTIVITIES ON OGBOMOSO RIVERS: CAUSES, EFFECTS AND ROLE OF AN INDIVIDUAL (OGBOMOSO RESIDENTS) IN PREVENTION OF WATER POLLUTION

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ABSTRACT

Nigerians have come to realized that environmental problems such as deterioration or degradation are not restricted to the developed areas alone. It appears that polluted environment is a global issue and if not properly handled, world community would bear worst results more as they already faced. The study therefore investigates the causes, effects and roles of individual on the management of these rivers and the environment and the health effects these can impose on the citizens. The study revealed that the human activities such as improper land disposal, run-off and agricultural activities amongst others could result to introduction of pollutants in the rivers. Therefore, in the attempt to reduce the effects caused by water pollution, there should be proper awareness and enlightenment on the causes, effects and the possible strategies to follow in order to combat this problem.

Keywords: *Deterioration, Global Issue, Environmental Problems, Pollutants, Water Pollution, Ogbomoso River, Improper Land Disposal*

INTRODUCTION

Pollution simply refers to as the effect of undesirable changes or as the negative outcome that originate from the inappropriate or mismanagement of the available resources thereby creating harmful effects on plants, animals and human beings. In recent years, it has come to signify a wider range of disruptions to environmental quality.

Most times, they occur when short-term economic gains are made at the cost of the long-term ecological benefits for humanity. During the last few decades, substances commonly known as pollutants are present, mostly greater than natural requirement which are produced due to human activity. These have a detrimental effect on our environment and also contaminated our air, water and land on which life itself depends with a variety of waste products.

Pollution is a necessary evil of all development. Due to lack of development of a culture of pollution control, there has resulted a heavy backlog of gaseous, liquid and solid pollution in environment. It has to be cleaned. Over the past decades, there has been increasing global concern over the public health impacts attributed to environmental pollution.

During this time, there has been a significant focus on the problems encountered by the environment. These have increase the number of agencies monitoring the utilization of the environment. Some of these are Environmental Protection Agency's (EPA), World Health Organisation (WHO) amongst others (Risiro *et al.*, 2013).

In this wise, the number of agencies dealing with environmental issues in developing countries such as Nigeria have also increased. The numbers of these agencies have increased from eleven (11) in 1972 to eighty seven (87) in 1979 (Egunjobi, 1993).

Nigerians have come to realized that environmental problems such as deterioration or degradation are not restricted to the developed areas alone. Developing areas could also battle with environmental problems like flooding, deforestation, soil erosion, refuse and sewage disposal amongst others. In their analysis, World Health Organization (WHO) estimates that environmental problems constitutes about a quarter of the health issues facing mankind today which are mostly due to either acute or chronic exposure to environmental pollution.

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Most of these environment-related diseases are however not easily detected and may be acquired during childhood and manifested later in adulthood.

There are incoherent and incomplete public awareness of environmental problems in Nigeria (Chokor, 1988). In Nigeria, there are different views on how the citizens handled their environments. The level of illiteracy could also contribute to this; vast majority of people are unaware of the magnitude of environmental problems confronting them and that only the better educated and high income groups seem to be able to make a connection between the health of their family and environment in which they live (Onibokun, 1992).

Through recent research survey, peoples have come to some form of conclusion that ordinary people possesses a substantial knowledge of the complexities of environmental problems besetting them and indeed make efforts to articulate and adjust favourably to them (Chokor, 1988; Egunjobi, 1983). The low public environmental consciousness stems from our national education system, which places a low priority on environmental education (Onibokun, 1993). Due to the level of havocs pollution can impose on man and his environments, the environmental evaluation on the causative and the effects of these pollutants must nit to be taken lightly. The nature and concentration of a pollutant determines the severity of detrimental effects on human health, an average human requires about 12 kg of air each day, which is nearly 12 to15 times greater than the amount of food we eat. Thus, even a small concentration of pollutants in the air becomes more significant in comparison to the similar levels present in food. Therefore, the environmental impacts of domestic and industrial outputs to man and his environment in Ogbomoso land should be study.

Geographical Location of Ogbomoso: Ogbomoso is a city in Oyo State, south-western Nigeria. It was founded in the mid 17th century. The population was approximately 645,000 in 1991; by March 2005, it was estimated at around 1,200,000. The city is considered one of Nigeria's largest urban centres. The majority of the people are members of the Yoruba ethnic group. Ogbomoso is the administrative headquarters of both Ogbomosho North and South Local Government Areas. It is situated 57 kilometers South-West of Ilorin, the capital of Kwara State; 104 kilometers North of Ibadan and 58 kilometers Northwest of Oshogbo, the capital of Osun state.

Major Rivers in Ogbomoso: The earth's surface is covered by water (about 17 %) only a tiny fraction of this water is available to us as fresh water. About 97% of the total water available on earth is found in oceans and is too salty for drinking or irrigation. The remaining 3% is fresh water. Ogbomoso is blessed with many rivers; these rivers contain different chemical elements depending on the activities and the managements. Table 1 shows the major rivers (figure 1) in Ogbomoso town and the activities around the river bank.

Water Pollution in Ogbomoso: Water contains essential ingredients or elements that contributes to our wellbeing and a healthy life. These chemical compounds are presented in reasonable concentrations which should not be exceeded (European Public Health Alliance, 2009). Several health and environmental agencies have combat pollution through awareness programmes and also through educating the citizens on the causing agents and their effects. In the view of this, WHO states that one sixth of the world's population, approximately 1.1 billion people do not have access to safe water and 2.4 billion people lack basic sanitation. Polluted water consists of Industrial discharged effluents, sewage water, rain water pollution (Ashraf *et al.*, 2010) and polluted by agriculture or households cause damage to human health or the environment (European Public Health Alliance, 2009).

Through research, it was discovered that more than half of Ogbomosho's rivers are polluted or partially treated with polluted water and leads to poor quality water, health hazard and death of human being, aquatic life and also disturbs the production of different crops (Hussain *et al.*, 2001; Kan, 2009; Khan, 2010; Wu *et al.*, 1999). In fact, the effects of water pollution are said to be the leading cause of death for man across the globe, moreover, water pollution affects our oceans, lakes, rivers and drinking water, making it a widespread and global concern (Scipeeps, 2009).

In the attempt to combat the environmental and health effects caused by improper handling of these rivers, the causative factors should be considered.

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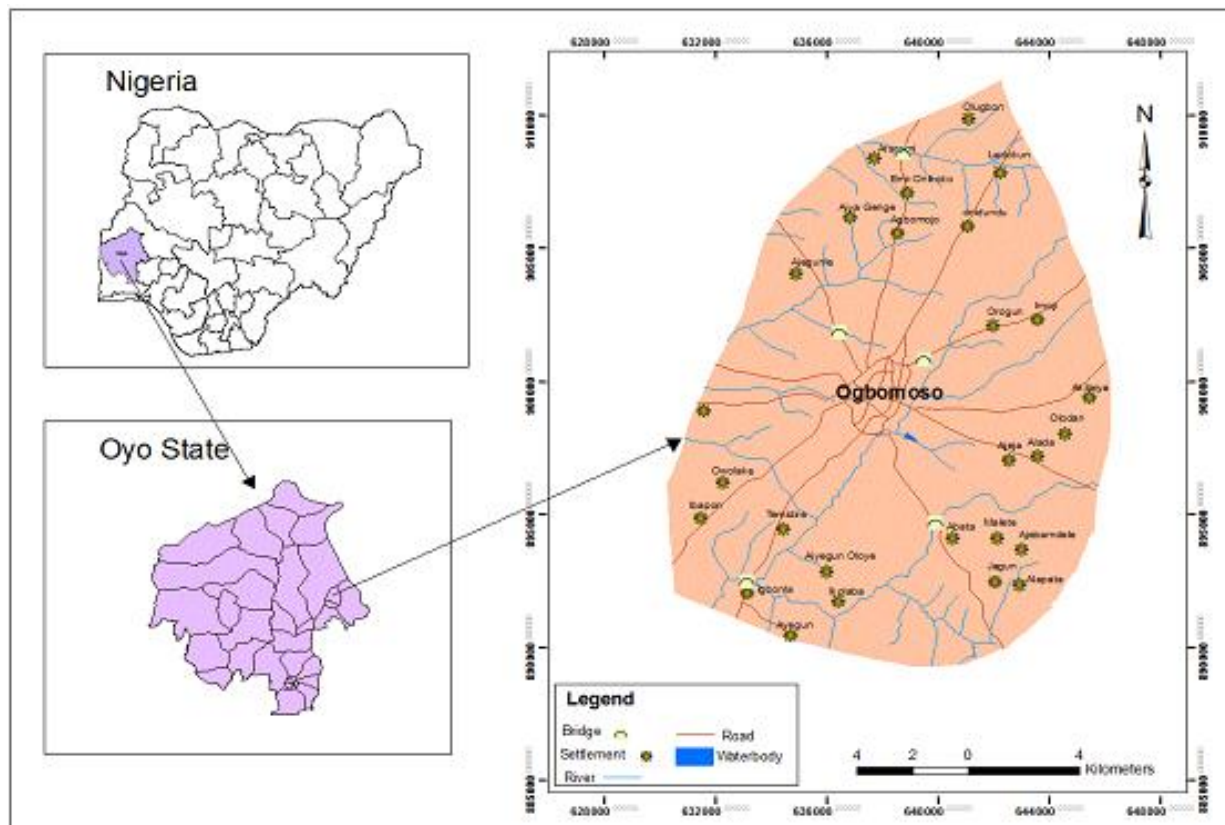


Figure 1: Map of the Study Area (Ogbomosho North and South LGAs)

Causes of Water Pollution (Rivers) in Ogbomosho

Improper Land Disposals: The most common and important causative factor which Ogbomosho Rivers is facing is improper waste disposals. The level at which this contributes to environmental pollution and degradation is alarming (Kimani, 2007).

Ogbomosho is known to be a developing area whereby people struggle for limited amount of resources to survive. The over dependent on limited amount of these available resources contributes to lack solid waste regulations and proper disposal facilities for harmful waste. Such waste may be infectious, toxic or radioactive.

Municipal waste dumping sites are designated places set aside for waste disposal. Almost all the rivers in Ogbomosho serves as a waste disposal site or medium for the people. Poor waste management poses a great challenge to the well-being of the residents, particularly those living adjacent the dumpsites due to the potential of the waste to pollute water, food sources, land, air and vegetation. The poor disposal and handling of waste thus, leads to environmental degradation, destruction of the ecosystem and poses great risks to public health (Khan, 2004).

In Ogbomosho, disease-causing agents (pathogens) which include bacteria, viruses, protozoa and parasitic worms enters the rivers from domestic sewage and untreated human and animal wastes. Human wastes contain concentrated populations of coliform bacteria such as *Escherichia coli* and *Streptococcus faecalis*. These bacteria normally grow in the large intestine of humans where they are responsible for some food digestion and for the production of vitamin K.

The daily deposition of human waste in these water bodies, increase the number of these bacteria which cause gastrointestinal diseases. Other potentially harmful bacteria from human wastes may also be present in smaller numbers.

Thus, the greater the amounts of wastes in the water the greater are the chances of contracting diseases from them.

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Table 1: The Rivers in Ogbomosho with their Respective Distance (km)

S/N	Name of River	Water Pollutant(s)
1.	Alalubosa	detergents, sewage, organic chemicals
2.	Odo-Oba	Fertilizer, herbicides, fungicides, detergents, sewage
3.	Aduin	detergents, sewage, organic chemicals
4.	Alapata	detergents, sewage, organic chemicals
5.	Kinira	detergents, sewage, organic chemicals
6.	Masifa	detergents, sewage, organic chemicals
7.	Oloko	detergents, sewage, organic chemicals
8.	Odokoto	detergents, sewage, fertilizers, herbicides, fungicides
9.	Odo-Oru	detergents, sewage, farming
10.	Ogunbado	detergents, sewage, detergents, organic chemicals
11.	Apake	detergents, sewage
12.	Ora	detergents, sewage, detergents, organic chemicals, fungicides, herbicides, fertilizers
13.	Odo-Osuru	detergents, sewage, fungicides, herbicides, fertilizers
14.	Odo-Eran	Animal waste, sewage, organic chemicals, herbicides, fertilizers
15.	Kuye	detergents, sewage, fungicides, herbicides, fertilizers, organic chemicals

Another cause of water pollution is the disposal of a variety of organic chemicals, such as oil, gasoline, plastics, pesticides, cleaning solvents, detergent and many other chemicals (figure 2). High levels of these chemicals in these rivers have been discovered to make the water unfit to drink, harm fish and other aquatic life, reduce crop yields and accelerate corrosion of equipment that use this water. These are harmful to aquatic life and human health.

Agricultural Practices: Farming activities is one of the common activities carrying out in Ogbomosho water banks. The planting of maize, vegetables and even yams are seen in almost all the rivers. Due to the level of demand, this has led to the use of fertilizers to boost and increase the yield of the farm produce. Fertilizers, fungicides, herbicides amongst others are commonly used to increase the agricultural activities in Ogbomosho. The quantity of fertilizers applied in a field is often many times more than is actually required by the plants. The chemicals such as sulphates, phosphates and nitrates in fertilizers and pesticides pollute soil and water and excess applications often cause eutrophication, bioaccumulation and biomagnifications. These are water soluble nitrates and phosphates that cause excessive growth of algae and other aquatic plants. They may interfere with the use of the water by clogging water intake pipes, changing the taste and odour of water and cause a build-up of organic matter. As the organic matter decays, oxygen levels decrease and fish and other aquatic species die.

Run-Off from Nearby Residents and Commercial Centres: Rivers are classified as surface water. The introduction of wastes or pollutants into the water bodies from nearby residents is the main route in which Ogbomosho rivers contact pollution. They believe that the transportation of this wastewater from the source to the receiving bodies has nullified the effects of these pollutants in the water. From table 1, different activities around the river side and residents indicates the cause of the foul smell, colour, taste and even high level of the water chemicals.

For instance, river Odo-Eran is known to harbour an abattoir. From research, it was discovered that more than 15 cows were slaughtered daily. The method of killing of cattle in the abattoir is the traditional method of slaughtering at the slaughter slab after inspection by the health officers. Waste generated in the abattoir include: bones, blood and dung.

There is no special waste disposal system or treatment. Dung is piled up and waste water containing blood and dung are discharged into the river with little or no treatment. This resulted into pollution of this river especially of the abattoir and residents in the abattoir vicinity. On effect of abattoir activities on health of respondents, studies cited previously have reported elevation of some symptoms among residents of intensive livestock operations (Wing and Wolf, 2000).

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Figure 2: The Polluted Rivers in Ogbomoso

Effects of Water Pollution in Ogbomoso

Effects of Water Pollution on Ogbomoso Residents: Environment dying is global perilous point which catastrophically the human, animals and plants. In recent time, due to the level of awareness, Ogbomoso residents have discovered that these rivers are not fit for drinking, though they believe the waters are safe for farming and other activities. In the view of this, the following environmental and health effects should be communicated. Water pollution results are Cancer (Ries *et al.*, 1999), neurobehavioral disorders (Mendola *et al.*, 2002), cardiovascular problems, reduced energy levels (Colls, 2002), premature death (European Public Health Alliance, 2009), asthma (Jacquemin *et al.*, 2009), asthma exacerbations (Nel, 2005), headaches and dizziness (Colls, 2002), irritation of eyes, nose, mouth and throat (Colls, 2002), reduced lung functioning (Gauderman *et al.*, 2005), respiratory symptoms (Vichit-Vadakan, 2001), respiratory disease (Firkat, 1931), disruption of endocrine (Crisp *et al.*, 1998) and reproductive and immune systems (European Public Health Alliance, 2009).

Effects of Dying Environment on Animals and Plants: The reduction and loss of wild life is directly related to pollution (Progressive Insurance, 2005). There have been many reports on the effects of the presence of certain chemicals on water bodies. These includes: leads to nutrient polluted water that causes

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overgrowth of toxic algae eaten by other aquatic animals, and may lead to suffocation and eruption of fish diseases; can cause declines in frog biodiversity and tadpole mass; can increase susceptibility to disease and reduce reproductive processes and negatively affect development of marine organisms; can cause reduced reproduction, slower growth and development, abnormal behaviour and death.

High concentration of sodium chloride (ordinary salt) in water may kill animals and plants, plants may be killed by mud from construction sites as well as bits of wood and leaves, clay and other similar materials and plants may be killed by herbicides in water (Kopaska-Merkel, 2000). For tree and plants water pollution may disrupt photosynthesis in aquatic plants and thus, affecting ecosystems that depend on these plants.

Water pollution closely associated to air and land pollution, so, its numerous effects come out as similar as caused by land and air contamination. Water pollution can alter metabolism of plants' metabolism and reduce crop yields and same process with microorganisms and arthropods in a given soil environment; this may obliterate some layers of the key food chain, and thus, have a negative effect on predator animal class.

Role of an Individual (Ogbomoso Residents) in Prevention of Water Pollution: There are a host of environmental problems caused by human activities on the environment. In the attempt to solve these problems, individual should know that he is responsible for the conditions of the quality of the environment we live in. Human actions can make or break, that is, worsens or improve our environmental quality. Man wants a clean and healthy environment, though the efforts to make these a reality lie with him. Several people may feel that environmental problems can be solved with quick technological fixes while few realize that major changes in their lifestyle that could contribute to a cleaner environment. This necessitates that individuals should not only be aware of various environmental issues and the consequences of their actions on the environment but should also make a firm resolve to develop environmentally ethical lifestyles.

With the help of awareness and governmental assistance, these wastes or pollutant can be treated or pre-treated to reduce the level of contamination or better still eradicate any forms of contamination of the rivers. These wastes can be diluted, decomposed and recycled by natural processes indefinitely as long as these processes are not overloaded. Government should provide better land disposal methods; improve drainage system; increase the numbers of health or environmental workers and most importantly, educate the residents on the causes and the environmental or health effects of these pollutants in Ogbomoso Rivers.

Conclusion and Recommendation

The study revealed that human activities have direct and indirect effects on the built-up environment and health of Ogbomoso residents especially those depending on these polluted water. The negative impacts of human activities such as farming, waste disposal, run-off from nearby residence and abattoir have a huge impact on the qualities of the rivers in Ogbomoso. The health quality of residents living in Ogbomoso was revealed to reduced due to effect of pollutants from human activities. Therefore, there is need to control all these activities by creating awareness on the causes and effects of these pollutants, providing adequate waste disposal medium and reducing the amount of wastewater emanating from different household by making use of septic tank. Different regulations and guidelines should be given to industries or commercial sites nearby these rivers contributing to water pollution. For abattoir, planning and construction, regulations controlling the movement and slaughtering of cows, the availability of services and staff in abattoirs should be made.

Cassava peel or other unwanted materials should not be thrown into the rivers. Laws and rules on land use, and waste regulation to control the location and management of wastes from these commercial places should be made.

In addition, public awareness and enlightenment on possible impact of pollution from these wastes should be embarked upon by relevant agencies and public participation to be included in the development of policies for the management.

Conflict of Interest: The authors agree there is no conflict of interest.

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